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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

# Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them

PR Docket No. 92-235

## References

**MAY 28 1963**

FCC MAIL BRANCH

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## **SUMMARY**

Bendix/King Corporation has been involved in the land mobile industry since 1982. During this time period, we have been an innovator of new technologies and systems. Bendix/King supports the idea of refarming in order to fully utilize the RF spectrum allowed. We believe the key to increased spectrum efficiency is through a combination of new technology and flexible regulation. Trial systems should be encouraged to gain experience with real-world application of technology. Once a system has proven successful in a trial environment, open technical standards, promoting competition, should be cooperatively developed. With the desired operational and technical requirements established the Commission will then be able to develop effective regulatory rules.

Narrow band operation is only one possible way to increase spectrum efficiency. Part 88 overly emphasizes narrow frequency channels instead of a broader measure such as users or information transmission per kHz. A balanced consideration must exist, allowing for other methods such as spread-spectrum or TDMA.

A number of manufacturers have proposed very narrow band (VNB) systems as a way to increase spectrum efficiency in the private land mobile spectrum. They use unproven technology that has been demonstrated, at best, through immature trial systems without large scale operational experience. We believe it is premature to open the 150-174 MHz and 450-470 MHz bands to such VNB systems. The present

220 MHz band allows for VNB operation and provides an excellent proving ground for these new technologies. Once proven, a standard can be formulated around the new technology and then these systems can be expanded to other bands.

*The economic and operational impact of new system introduction must be addressed when considering new technology.* Seamless migration from old to new systems is critical for many users. For example, a momentary disruption of a police department communication system could endanger life. This disruption could easily originate from an unproven system operating in the same geographic area. Present investment and replacement cost are other very important issues. Communications users in these bands have invested many millions of dollars in their current systems. These users cannot afford to completely and suddenly replace their system.

We believe the Commission must carefully limit the number of different system types allowed to operate in the 150-174 MHz and 450-470 MHz. We believe this is necessary in order to promote commonality. In addition, the technical standards defining these systems must be open, allowing multiple manufacturers to produce compatible equipment. Without Commission limitations a large number of proprietary system standards undoubtedly will develop, effectively reducing spectrum efficiency. Each of these systems would require expensive manufacturer-specific or proprietary equipment. Communication between users of different systems would not be possible. Witness the current status of trunking systems in the 800 MHz band. Only one of the major vendors' systems could be considered open. Users of this type of system can select from numerous equipment vendors that compete on the basis of

user driven features and price, encouraging product innovation. Users of proprietary system types must purchase their equipment from the original vendor at higher prices and experience a much slower product evolution.

The Commission should encourage the system definition work currently undertaken by the Association of Police Communications Officers (APCO) project 25 committee in cooperation with the Telecommunications Industry Association (TIA). This user driven committee is an example of how new system standards can be developed. Multiple manufacturers are pooling their technical know-how to devise a spectrally efficient, open system standard meeting the needs of public safety users.

Finally, we believe 12.5 kHz wide channel operation should be immediately allowed in the 150-174 MHz and 450-470 MHz bands. System operation using 12.5 kHz is well understood, with widespread use throughout Europe. Many existing systems in the United States can be readily adapted for 12.5 kHz operation. (The adaptation will require new equipment, proposals to simply reduce transmitter deviation on existing equipment will not yield the desired spectral efficiency.) This position is consistent with recent mandates from the National Telecommunications and Information Administration (NTIA) for government users; and the first phase of the APCO 25 committee recommendation.

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**COMMENTS OF BENDIX/KING RADIO CORPORATION FCC MAIL BRANCH**

Bendix/King hereby submits its comments to the FCC's *Notice of Proposed Rule Making ("Notice")* in the above-captioned proceeding. In such a far reaching document as PR 92-235, the FCC must be careful in instituting rules that are unachievable without sacrificing the present quality of service. With this in mind, Bendix/King has the following comments.

**1. THE SIGNIFICANT IMBEDDED INVESTMENT IN EQUIPMENT MUST BE CONSIDERED**

The economic and operational impact of new system introduction must be addressed when considering new technology. Seamless migration from old to new systems is critical for many users. For example, a momentary disruption of a police department communication system could endanger life. This disruption could easily originate from an unproven system operating in the same geographic area. Present investment and replacement cost are other very important issues. Present

investment has been estimated to be \$25 billion dollars. Communications users in these hands have invested many millions of dollars in their current systems. These

involved in defining "Spectrum Efficiency". To this end, Bendix/King supports the activity that has been undertaken by the Telecommunications Industries Association (TIA) in defining Spectrum Efficiency measurement criteria. The TIA spectrum efficiency criteria will include: (1) the size of the service area requested; (2) the amount of spectrum requested; (3) the reliability of the system; (4) the number of users proposed to serve.

**3. IT IS PREMATURE FOR THE FCC TO MANDATE 5 kHz AND 6.25 kHz CHANNELS**

Bendix/King believes that mandating channel spacings of 5 kHz at VHF and 6.25 kHz at UHF is premature. Bendix/King is well aware that the FCC has allocated 5 kHz channels in the 220-222 MHz band and that several manufactures have announced product. However, Bendix/King has no knowledge of the existence of any proven very narrow band system that is installed in an existing stressed environment. Bendix/King recommends that the 220-222 MHz band be allowed to mature and therefore prove the viability of VNB systems before any mandate for very narrow band operation is instituted for VHF and UHF.

In the interim, Bendix/King believes that a transition to "true" 12.5 kHz equipment, or equivalent efficiency, in both the VHF and UHF land mobile bands is proper. Bendix/King recommends that the FCC adopt at least a 10 year plan beginning with the effective date of a Report and Order in this proceeding before requiring existing licensees to comply with the new spectrum efficiency standards and before mandating the use of the new narrow band (12.5 kHz) equipment by new licensees/operators. During this transition period, the use of equipment that is in

conformance with the new standards by both new licensees and existing licensees be on a voluntary or optional basis. A ten year transition period will allow existing licensees to amortize the value of their mobile and portable radios and maximize the useful life of their equipment. It will also minimize any disruption to the critical communications systems that compromise the private land mobile services, and allow a reasonable time to plan replacement of infrastructure.

**4. THE FCC's CHANNELING PLAN SHOULD PROMOTE TECHNICAL FLEXIBILITY**

Bendix/King objects to the Commission's proposed channelization scheme which does not permit block allocations in the bands below 800 MHz. For example, one of the Commission's proposal for the 5 kHz channeling plan is the 150 MHz band would allocate one third of the channels for carrier operations.

Bendix/King is concerned that interspersing of different categories will thwart

the development of new technologies. As the Commission moves forward with this plan

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and 6.25 kHz for the UHF band. In the opinion of Bendix/King, different target bandwidths for these two bands is not a wise policy and the FCC should choose a single channel bandwidth for these two bands as a long term target.

Designing unique equipment for each band requires additional development cost. These additional cost will ultimately raise the cost of the final product. Bendix/King has been involved in the APCO Project 25 development from inception. The APCO Project 25 standard is based initially on a 12.5 kHz channel spacing plan with an increased spectrum efficiency of 2:1 over present systems. The Goal of APCO 25 is a 4:1 spectrum efficiency improvement possibility using 6.25 kHz channeling. Ultimately, if a common channeling plan of 6.25/12.5 kHz were not adopted the APCO standard setting process would have to be delayed while adjustments were made to data BAUD rate, modulation schemes, etc. The further delay would prohibit users from realizing the spectrum efficiencies from this technology.

## **6. RECOMMENDATIONS FOR EMISSION MASKS**

Bendix/King recommends that the 12.5 kHz emission mask be no more stringent than the mask described in 47 CFR 90.209 for transmitters operating in the 896-901 and 935-940 MHz bands. If the mask were more stringent, the audio response would have to be reduced therefore causing a decrease in quality of the service. Bendix/King realizes that other modulation schemes could be instituted, but these in general are unproven and as previously mentioned, should not be mandated at this time.

## **7. CONCLUSION**

The Commission's refarming proceeding is an ambitious timely review of the technical parameters affecting the private land mobile services. Bendix/King urges that the Commission move cautiously in changing the regulations for the Land Mobile Spectrum. Bendix/King urges the Commission to reevaluate the proposals presented in the NPRM in the following areas: (1) Definition of "True Spectrum Efficiency", (2) Limiting proprietary systems, (3) Allowing the 220-222 MHz band to mature before further mandating of VNB, and (4) a 12.5 kHz channel spacing phase-in commencing with the release of the Report and Order. Finally, Bendix/King believes that Increased spectrum efficiency can be achieved, but the quality of service must not be sacrificed.